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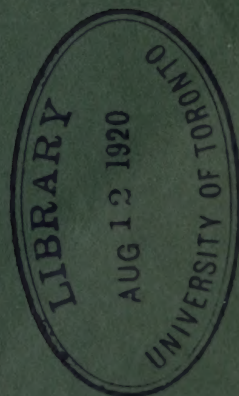
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Agricultural Research Institute, Pusa

# A Note on the Treatment of Surra in Camels by Intravenous Injections of Tartar Emetic

BY

H. E. CROSS, M.R.C.V.S., D.V.H., A.Sc.,  
*Camel Specialist, Sohawa, Punjab.*



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# A Note on the Treatment of Surra in Camels by Intravenous Injections of Tartar Emetic

(Received for publication on 3rd December, 1919.)

In the early part of 1917, I carried out experiments with tartar emetic in connection with the treatment of surra in camels. Six camels were finally submitted to treatment, and the results obtained may be of interest to those at present working on surra in camels and other animals.

From the 27th August, 1917, to the 22nd July, 1919, these camels were kept under observation by Captain Pool, I.A.R.O., who during this period was in charge of the laboratory. I am indebted to him for the daily blood examination and the care of these camels during this time.

*Camel No. 1.* Obtained from the 53rd Silladar Camel Corps, Sargoda. Aged 8 years. Condition poor.

Received the following treatment :—

|            |                                                                    |           |
|------------|--------------------------------------------------------------------|-----------|
| 1917       |                                                                    |           |
| June 2nd . | 200 c.c. of a 1 per cent. solution of tartar emetic intravenously. | Fed well. |
| June 3rd . | Do.                                                                | Fed well. |
| June 4th . | 250 c.c. of a 1 per cent. solution of tartar emetic intravenously. | Fed well. |
| June 5th . | Do.                                                                | Fed well. |
| June 6th . | Do.                                                                | Fed well. |
| June 7th . | Do.                                                                | Fed well. |

After the last dose the camel went off feed and did not feed normally for two days.

The camel never did well and died on 14th October in an emaciated condition 129 days after treatment finished but no trypanosomes reappeared in the blood.

*Camel No. 2.* Obtained from the 53rd Silladar Camel Corps, Sargoda. Condition poor. Aged 9 years.

Received the following treatment :—

|            |                                                                    |                                                                  |
|------------|--------------------------------------------------------------------|------------------------------------------------------------------|
| 1917       |                                                                    |                                                                  |
| May 26th . | 600 c.c. of a 1 per cent. solution of tartar emetic intravenously. | Shortly after injection respiration became very rapid. Off feed. |
| May 27th . |                                                                    | Off feed.                                                        |
| May 28th . |                                                                    | Off feed.                                                        |
| May 29th . |                                                                    | Off feed.                                                        |
| May 30th . |                                                                    | Fed fairly.                                                      |
| May 31st . |                                                                    | Fed fairly.                                                      |
| June 1st . |                                                                    | Fed well.                                                        |



This camel continued to feed well but never improved in condition. An injury to the leg necessitated an operation on November 21st, from which he did not recover.

No trypanosomes reappeared in the blood since treatment finished (179 days).

*Camel No. 3.* Obtained from the 52nd Silladar Camel Corps, Jhelum. Condition poor. Aged 7 years.

Received the following treatment :—

|            |                                                                     |           |
|------------|---------------------------------------------------------------------|-----------|
| 1917       |                                                                     |           |
| May 23rd . | 250 c. c. of a 1 per cent. solution of tartar emetic intravenously. | Fed well. |
| May 24th . | Do.                                                                 | Fed well. |
| May 25th . | Do.                                                                 | Fed well. |

On the morning of 26th the camel was off feed and did not feed well for 4 days ; after this he fed well and improved greatly in condition. Died on July 14th, 1919, as result of falling down a Khud in the grazing ground.

This camel worked constantly from 15th January, 1919, to 1st May, 1919, carrying a load of 5 maunds 24 miles one day and 14 the next, or an average of 19 miles a day.

Two hundred and forty-one days after treatment finished one guinea pig and one rabbit were inoculated with blood from this camel but remained healthy.

No trypanosomes reappeared in the blood since treatment finished (780 days).

*Camel No. 4.* Obtained from the 54th Silladar Camel Corps, Lahore. Condition fair. Aged 7 years.

Received the following treatment :—

|            |                                                                    |             |
|------------|--------------------------------------------------------------------|-------------|
| 1917       |                                                                    |             |
| May 23rd . | 200 c.c. of a 1 per cent. solution of tartar emetic intravenously. | Fed well.   |
| May 24th . | Do.                                                                | Fed well.   |
| May 25th . | 250 c.c. of a 1 per cent. solution of tartar emetic intravenously. | Fed well.   |
| May 26th . | Do.                                                                | Fed well.   |
| May 27th . | Do.                                                                | Fed well.   |
| May 28th . | Do.                                                                | Fed fairly. |

For three days after the last dose the camel did not feed well, but after this he fed well and improved in condition.

Two hundred and thirty-eight days after treatment finished one guinea pig and one rabbit were inoculated with blood from this camel, but remained healthy.

Died on 23rd October, 1919, whilst being castrated.

No trypanosomes reappeared in the blood since treatment finished (513 days).



*Camel No. 5.* Obtained from the 65th Government Camel Corps, Campbellpur. Condition poor. Aged 9 years.

Received the following treatment :—

| 1917       |                                                                    |             |
|------------|--------------------------------------------------------------------|-------------|
| May 18th . | 200 c.c. of a 1 per cent. solution of tartar emetic intravenously. | Fed well.   |
| May 20th . | 250 c.c. of a 1 per cent. solution of tartar emetic intravenously. | Fed well.   |
| May 22nd . | Do.                                                                | Fed well.   |
| May 24th . | Do.                                                                | Fed well.   |
| May 26th . | Do.                                                                | Fed well.   |
| May 28th . | Do.                                                                | Fed well.   |
| May 30th . | Do.                                                                | Fed well.   |
| June 1st . | Do.                                                                | Fed fairly. |
| June 3rd . | Do.                                                                | Fed fairly. |
| June 5th . | Do.                                                                | Fed fairly. |

For five days after the last dose the camel fed only fairly but after this he fed well and improved in condition.

Two hundred and thirty days after treatment finished one guinea pig and one rabbit were inoculated with blood from this camel, but remained healthy.

From 15th January, 1919, to 1st May, 1919, this camel worked constantly, carrying a load of 5 maunds 24 miles one day and 14 next, or an average of 19 miles a day.

No reappearance of trypanosomes for 887 days since treatment finished (November 8th, 1919).

Condition (November 8th, 1919) good.

*Camel No. 6.* Obtained from the 52nd Silladar Camel Corps, Jhelum. Condition fair. Aged 8 years.

Received the following treatment :—

| 1917         |                                                                   |           |
|--------------|-------------------------------------------------------------------|-----------|
| March 20th . | 60 c.c. of a 1 per cent. solution of tartar emetic intravenously. | Fed well. |
| March 22nd . | Do.                                                               | Fed well. |
| March 24th . | Do.                                                               | Fed well. |
| March 26th . | Do.                                                               | Fed well. |
| March 28th . | Do.                                                               | Fed well. |
| March 30th . | Do.                                                               | Fed well. |
| April 1st .  | Do.                                                               | Fed well. |
| April 3rd .  | Do.                                                               | Fed well. |
| April 5th .  | Do.                                                               | Fed well. |
| April 7th .  | Do.                                                               | Fed well. |

This camel fed well during the whole of the treatment.

Two hundred and eighty-nine days after treatment finished one guinea pig and one rabbit were inoculated with blood from this camel, but remained healthy.

This camel worked continuously from 15th January, 1919, to 1st May, 1919, carrying a load of 5 maunds 24 miles one day and 14 miles the next, or an average of 19 miles a day.



No reappearance of trypanosomes for 945 days since treatment finished (November 8th, 1919).

Condition at present time (November 8th, 1919) good.

*Summary.*

|                                                             | Number of days trypanosomes absent since treatment finished | Condition              |
|-------------------------------------------------------------|-------------------------------------------------------------|------------------------|
|                                                             | Days                                                        |                        |
| Camel 1.—Died from debility . . . . .                       | 129                                                         | Very poor.             |
| Camel 2.—Died as result of operation . . . . .              | 179                                                         | Poor.                  |
| Camel 3.—Died as result of fall in grazing ground . . . . . | 780                                                         | Very good.             |
| Camel 4.—Died whilst undergoing castration . . . . .        | 513                                                         | Good.                  |
| Camel 5.—Alive . . . . .                                    | 887                                                         | Alive, good condition. |
| Camel 6.—Alive . . . . .                                    | 945                                                         | Alive, good condition. |

*Remarks.*

(1) From these experiments one may justly conclude that camels Nos. 3, 4, 5 and 6 were cured and that tartar emetic gives promise of success in the treatment of surra; but before tartar emetic can be definitely stated to be a cure for surra, a large number of animals must be submitted to treatment, so that definite conclusions can be arrived at.

(2) Great care has to be exercised when injecting tartar emetic, owing to the fact that if any of the solution, instead of being injected into the vein, is injected subcutaneously, sloughing results.

(3) Injection of tartar emetic is liable to cause fainting; it must be injected slowly at blood heat.

I have found that—

(a) fainting is not so liable to occur if the injection is given during the intervals between the paroxysms, *i.e.*, when the temperature is not high,

(b) large doses, say 600 c.c. of a 1 per cent. solution, can be safely given in one day to fully grown camels if the amount is given in 3 injections with 2-3 hours' interval between the injections; whereas in the majority of cases if 600 c.c. of a 1 per cent. solution is given in one injection death results.



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